IMPROVING SOCIAL DETERMINANTS OF HEALTH WITH PUBLIC POLICY: AN INTERDISCIPLINARY APPROACH

Monday, May 21
3:30 PM - 5:00 PM

#prematuritycollab
Improving Social Determinants of Health with Public Policy: An Interdisciplinary Approach

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Socioeconomic Position
– Social Class, Gender, Ethnicity –
A Social Determinant Of Health

• Birth Outcomes
• Child Health
• Adolescent Health
• Adult Health
• Premature Mortality
Social Determinants of Birth Outcomes Conceptual Framework

Socioeconomic Position
- Poverty
- Gender & Racial Discrimination

Mediators
- Health Behaviors & Exposures
- Toxic Stress Weathering
- Health Care Access & Quality

Birth Outcomes
- Low Birth Weight
- Preterm Birth
- Infant Mortality
What Does Law Have To Do With It?

Laws shape societal conditions

Laws shape exposures & behaviors

Social Economic Physical

Health Outcomes

- Alcohol & tobacco control
- SNAP & WIC
- ACA

WHAT IS HEALTH IN ALL POLICIES?
Social Determinants of Birth Outcomes
Conceptual Framework

Socioeconomic & Political Context
- Family Economic Security Policies

Socioeconomic Position
- Poverty
- Gender & Racial Discrimination

Mediators
- Health Behaviors
- Toxic Stress Weathering
- Health Care Access & Quality

Birth Outcomes
- Low Birth Weight
- Preterm Birth
- Infant Mortality
Understanding How Law Affects Health
Scientific Contributions from Multiple Disciplines

- Law
- Social & Behavioral Sciences
- Epidemiology
- Economics
- Statistics
PUBLIC HEALTH LAW RESEARCH

Theory and Methods

Framing
Theories
Legal Coding
Research Designs
Design Elements
Cost Analysis

http://publichealthlawresearch.org/theory-methods
Natural Experiments

- Experimenting society
- Scientists do not control when and where “treatments” are implemented
- Changes over time in laws and policies
- Well-designed studies using multiple design elements
- Real-world settings facilitate diffusion of effective strategies

1. Minimum Wage Laws
2. Earned Income Tax Credit (EITC)
3. Unemployment Insurance
4. Temporary Assistance for Needy Families (TANF)

R01 funded by the National Institute on Minority Health and Health Disparities, 2015-2019
Scientific Legal Data
And Why It Matters

Scott Burris, JD

Center for Public Health Law Research
Temple University
Conflict of Interest

Scott Burris is a founder and board member of Legal Science LLC, a private company that provides MonQcle\textsuperscript{sm} software for collection and coding of legal data for policy surveillance.
We All Know Law Matters to Health

- Law is a primary tool of intervention for health
- Laws have huge unintended effects on health
- Law defines the powers and duties of health agencies.
An Impressive Evidence Base (in certain towers of excellence)

Legal Regulation of Health-Related Behavior: A Half Century of Public Health Law Research
Scott Barts and Evan Anderson
email: lawhealth@temple.edu

Keywords
legal evaluation, health policy, interventional public health law

Abstract
Legal intervention to influence individual health behavior has increased dramatically since the 1960s. This article describes the rise of law as a tool of public health and the scientific research that has supported and often guided it, with a focus on five major domains: smoking, gun violence, tobacco use, reproductive health, and obesity. Three topical stories illustrate both law's effectiveness and its limitations as a public health tool. They are also notable for their importance to the future of public health law research and policy. For example, increased research on tobacco use in the last three decades suggests that policy makers need to use a variety of interventions to achieve their health goals. These limitations in turn highlight the need for new and creative research to inform public health law interventions.
A Not-So-Crazy Comparison: Drugs and Laws Are Both Interventions

- **FDA Process for New Pharmaceuticals**
  - Preclinical research
  - Phase I trials for safety and dosage
  - Phase II trials for effectiveness and side effects
  - Phase III: verify safety and monitor longer term adverse effects
  - Post-approval surveillance

- **Process for New Laws**
Nowhere Near Enough Funding
The Five Essential Public Health Law Services

Access to Evidence and Expertise
Expertise in Designing Legal Solutions
Help Engaging Communities and Building Political Will
Support for Enforcing and Defending Legal Solutions
Policy Surveillance and Evaluation

Better Health for All Faster
Legal Epidemiology (aka Public Health Law Research)

“The scientific study of the relation of law and legal practices to population health.”
Policy Surveillance

The ongoing systematic collection and analysis of laws of public health significance
Methods
## Law as Data

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<td>7.15</td>
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### Questions

1. **Question 1**: Is there a state minimum wage law?
   - **Question Type**: Categorical - mutually exclusive
   - **Variable Name**: SMW.Law
   - **Variable Values**: 1, 2
   - **Value Label**: 1 = Yes, 2 = No
2. **Question 2**: What is the state minimum wage rate?
   - **Question Type**: Currency Field
   - **Variable Name**: MinWage_StateRate
   - **Variable Values**: N/A
3. **Question 3**: What is the actual rate?
   - **Question Type**: Currency Field
   - **Variable Name**: MinWage_standardrate
   - **Variable Values**: N/A
Direct Dispensing of Controlled Substances Laws

7/26/2017 → 10/1/2017
(states) Alaska, United States of America

Questions

1. Are Physicians expressly granted the authority to directly dispense controlled substances to patients?
   1. Controlled substance.

1.1 Are there restrictions on how large of a supply a physician may dispense?
   1

1.2 Are there any restrictions on charging for directly dispensed drugs?

(a) A licensee may not issue

1. An initial prescription for an opioid that exceeds a seven-day supply to an adult patient for outpatient use;

2. A prescription for an opioid that exceeds a seven-day supply to a minor; at the time a licensee writes a prescription for an opioid for a minor, the licensee shall discuss with the parent or guardian of the minor why the prescription is necessary and the risks associated with opioid use.

(b) Notwithstanding (a) of this section, a licensee may issue a prescription for an opioid that exceeds a seven-day supply to an adult or minor patient if, in the professional medical judgment of the licensee, more than a seven-day supply of an opioid is necessary for
LawAtlas.org

The Policy Surveillance Program
A LawAtlas Project

Explore the Law
Laws and policies from a broad array of health topics accessible for day-to-day use by lawyers and non-lawyers alike.

Explore the Law
Access maps, tables, data and reports that describe the current state of health laws and how they have changed over time.

Learning Library
Learn how to create your own policy surveillance and legal mapping projects.

About Us
Learn more about the Policy Surveillance Portal, and our work at the Policy Surveillance Program at Temple University.
Track Trends (and support change)

2009

2011

2014

“Lystedt” Youth Concussion Laws
Provide access to innovation
New Directions in Policy Education and Advocacy
New Directions in Policy Education and Advocacy

Creating the new gold standard for health and well-being in cities

CityHealth offers the first-ever assessment of how our nation’s 40 largest cities fare when it comes to policies that can make real, lasting impacts in people’s everyday quality of life. All of our recommendations are based in evidence, backed by experts, and have a track record of bipartisan support. Learn what’s happening in a city near you.
Policy Surveillance Process

1. Defining the scope
2. Conducting background research
3. Developing coding questions
4. Collecting the law and creating the legal text
5. Coding the law
6. Publishing and dissemination
7. Tracking and updating the law

Key Characteristics:
- It uses a systematic approach
- The process is replicable
- It emphasizes transparency
- There is a focus on delivering a highly accurate product through quality control

Quality control ensures accuracy and consistency throughout the process.
We are here to help in better evaluating law and telling compelling policy stories through data.

We offer:
- Training in policy surveillance and legal epidemiology
- Policy surveillance services
- Evaluation
The Effect of an Increased Minimum Wage on Infant Mortality and Birth Weight

Kelli A. Komro, PhD, MPH, Melvin D. Livingston, PhD, Sara Markowitz, PhD, and Alexander C. Wagenaar, PhD
Minimum Wage Standards

- Current federal minimum wage
  - $7.25 / hour
  - $15,080 full time

- Poverty threshold
  - Parent and one child: $15,930
  - Parent and two children: $20,090

- Minimum wage workers
  - Women
  - Low educational attainment
  - Young workers
  - Service industry
State of Minimum Wage Laws

Methods

• Natural experiment
• 50-state, 30-year study
• 206 legal changes in state minimum wage across 33 states from 1980-2011
• Value averaging $7.01 ($5.58 to $10.44)
• State-months that differed from federal averaged $1.03 ($0.03 to $3.10)

Analysis

• **Dependent variables**
  • Low birth weight (<2,500 grams)
  • Post-neonatal mortality (28-364 days)

• **Difference-in-differences analytic approach**
  • Difference between state-level and federal minimum wage from 1980-2011
  • Adjusted for inflation and expressed in 2011 dollars
  • State and year fixed effects
  • State-level covariates: % African American, mean age of mothers, poverty rate, cigarette sales
### State-level Minimum Wage and Birth Outcomes

#### Low Birth Weight Births

<table>
<thead>
<tr>
<th></th>
<th>Change in Rate per 100 Live Births (SE)</th>
<th>P-value</th>
<th>% Change (95% CI)</th>
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</thead>
<tbody>
<tr>
<td>Crude</td>
<td>-0.12 (0.04)</td>
<td>&lt;0.01</td>
<td>-1.9% (-3.1%, -0.7%)</td>
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<tr>
<td>Adjusted</td>
<td>-0.07 (0.03)</td>
<td>0.03</td>
<td>-1.1% (-2.1%, -0.1%)</td>
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<tr>
<td>Crude, 12-month Lagged</td>
<td>-0.14 (0.05)</td>
<td>&lt;0.01</td>
<td>-2.2% (-3.6%, -0.8%)</td>
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<tr>
<td>Adjusted, 12-month Lagged</td>
<td>-0.09 (0.04)</td>
<td>0.06</td>
<td>-1.3% (-2.7%, 0.0%)</td>
</tr>
</tbody>
</table>

# State-level Minimum Wage and Birth Outcomes

**Post-neonatal Infant Mortality**

<table>
<thead>
<tr>
<th></th>
<th>Change in Rate per 1000 Live Births (SE)</th>
<th>P-value</th>
<th>% Change (95% CI)</th>
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<tbody>
<tr>
<td>Crude</td>
<td>-0.16 (0.04)</td>
<td>&lt;0.01</td>
<td>-4.9% (-7.3%, -2.5%)</td>
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<tr>
<td>Adjusted</td>
<td>-0.13 (0.04)</td>
<td>&lt;0.01</td>
<td>-4.0% (-6.4%, -1.6%)</td>
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<tr>
<td>Crude, 12-month Lagged</td>
<td>-0.15 (0.04)</td>
<td>&lt;0.01</td>
<td>-4.5% (-6.9%, -2.2%)</td>
</tr>
<tr>
<td>Adjusted, 12-month Lagged</td>
<td>-0.12 (0.04)</td>
<td>&lt;0.01</td>
<td>-3.6% (-6.0%, -1.2%)</td>
</tr>
</tbody>
</table>

State-level Minimum Wage and Birth Outcomes

Implications

• $1 increase in minimum wage associated with:
  • 1 to 2% decrease in low birth weight births
  • 4% decrease in post-neonatal mortality

• If all states in 2014 had increased their minimum by $1:
  • 2,790 fewer low birth weight births
  • 518 fewer post-neonatal deaths
Effects of state-level Earned Income Tax Credit laws in the U.S. on maternal health behaviors and infant health outcomes

Sara Markowitz a, Kelli A. Komro b,*, Melvin D. Livingston c, Otto Lenhart d, Alexander C. Wagenaar b
What is the EITC?
- The Earned Income Tax Credit (EITC) is a tax credit designed to supplements the incomes of low-and moderate income workers.
- Federal benefit claimed on tax returns
- 26 states also have an EITC
- Refundable/non-refundable
MOTIVATION

• EITC programs are successful in:
  • supplementing income
  • reducing poverty
  • increasing labor force participation

• Are there secondary effects?
  • Research has shown the Federal EITC improves adult and child health
  • Limited research on state EITC. Some evidence for improved child health
CONTRIBUTION

• We focus on the effects of state EITCs and ask whether the presence and generosity of state EITCs are associated with improved infant health outcomes
• Examine some possible mechanisms via maternal health behaviors
Maternal Health and Health Behaviors

- Purchase medical care, nutrition
- Purchase cigarettes or alcohol
- Relieve financial stress

Birth Outcomes

EITC

Increases family income
Alters work incentives (mother or spouse)
ANALYTICAL FRAMEWORK

- EITC
- Family Income
- Maternal Health and Health Behaviors
- Birth Outcomes
EMPIRICAL METHODS

• Data from 1994-2013
• Merge state level EITC benefits data with data from birth certificates
• Linear regression analytic approach
  • Shows the effects of increased generosity of state EITC in altering maternal and infant health outcomes
• Models also control for:
  • Maternal characteristics
  • County-level factors
  • State fixed effects and conception year-by-quarter fixed effects
STATE EITC

• In 1994, 5 states had an EITC → In 2013, 26 states had an EITC
• State-specific EITC ranges from 3.5% to 40% of the federal amount, varies by number of children, refundability.

EITC summary measure

<table>
<thead>
<tr>
<th>Least generous</th>
<th>States with an EITC, <strong>nonrefundable</strong> payments, and payments less than 10% of the federal amount</th>
<th>States with an EITC, <strong>refundable</strong> payments, and payments less than 10% of the federal amount</th>
<th>States with an EITC, <strong>nonrefundable</strong> payments, and payments 10% or more of the federal amount</th>
<th>States with an EITC, <strong>refundable</strong> payments, and payments 10% or more of the federal amount</th>
<th>most generous</th>
</tr>
</thead>
<tbody>
<tr>
<td>States with no EITC</td>
<td>States with an EITC, <strong>nonrefundable</strong> payments, and payments less than 10% of the federal amount</td>
<td>States with an EITC, <strong>refundable</strong> payments, and payments less than 10% of the federal amount</td>
<td>States with an EITC, <strong>nonrefundable</strong> payments, and payments 10% or more of the federal amount</td>
<td>States with an EITC, <strong>refundable</strong> payments, and payments 10% or more of the federal amount</td>
<td>most generous</td>
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## BIRTH CERTIFICATE DATA 1994-2013

<table>
<thead>
<tr>
<th>Infant Health Outcomes</th>
<th>Maternal Health Behaviors</th>
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</thead>
<tbody>
<tr>
<td>Birth Weight</td>
<td>1st Trimester prenatal care</td>
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<tr>
<td>Birth Weight less than 2500 g</td>
<td>Smoking during pregnancy</td>
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<tr>
<td>Gestation weeks</td>
<td>Drinking during pregnancy (limited years)</td>
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<tr>
<td></td>
<td>Adequate Weight Gain</td>
</tr>
</tbody>
</table>

Limit sample to mothers with high school education or less, singleton births, women 18 or older.

Additional models further limit sample to:
- Married women
- Single women
- First birth (prior year’s EITC for zero children)
- Second or more birth (prior year’s EITC for one or more children)
## BIRTH OUTCOME RESULTS

<table>
<thead>
<tr>
<th></th>
<th>Birth Weight in Grams</th>
<th>Birth Weight &lt;2500g</th>
<th>Gestation Weeks</th>
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</thead>
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<td>Low EITC No Refund</td>
<td>9.441** (3.605)</td>
<td>-0.003*** (0.001)</td>
<td>0.048 (0.029)</td>
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<td>Low EITC With Refund</td>
<td>16.845** (6.883)</td>
<td>-0.005*** (0.002)</td>
<td>0.026 (0.037)</td>
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<td>High EITC No Refund</td>
<td>12.681*** (3.680)</td>
<td>-0.003*** (0.001)</td>
<td>0.165*** (0.017)</td>
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<td>27.307*** (6.083)</td>
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<tr>
<td>Mean of outcome</td>
<td>3280</td>
<td>0.07</td>
<td>38.75</td>
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Note: standard errors adjusted for clustering at the state level in parentheses
*statistically significant at $\alpha=0.05$
Fig. 2. Effects of EITC Generosity on Birth Weight Using Unconditional Quantile Regression at 5th through 95th Quantiles.
Note: N = 30,780,950. Solid marker indicates point estimate is statistically significant at the 5% level.
## MATERNAL HEALTH BEHAVIORS
### RESULTS

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<th>Low EITC No Refund</th>
<th>1st Trimester Prenatal Care</th>
<th>Smoked</th>
<th>Drank alcohol (1994-2006)</th>
<th>Adequate Weight Gain</th>
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<td>0.048** (0.023)</td>
<td>-0.016*** (0.004)</td>
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<td>0.005 (0.006)</td>
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<td>0.007 (0.008)</td>
<td>-0.001 (0.002)</td>
<td>-0.0002 (0.006)</td>
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</table>

Note: standard errors adjusted for clustering at the state level in parentheses
*statistically significant at $\alpha=0.05$
RESULTS FOR SUBGROUPS

- Single mothers, married mothers, mothers with at least one prior birth
  - Results pattern similar to all low-educated mothers

- Women with no prior births
  - Size of birth weight and gestation weeks effects fall, many coefficients insignificant.
  - This group of women least likely to work and be eligible for the EITC
CONCLUSIONS

• State EITCs are associated with small improvements in birth outcomes.

• Largest birth weight increases occurred at the lowest birth weights, increasing weight by 1%-1.5% in the most generous states.

• More generous state EITCs associated with reductions in the probability of LBW, ranging from 0.3 to 0.8 percentage points, which represents 4%-11% reductions at the mean.
  • Translates into reductions of 4,300 to 11,850 babies born low birth weight every year among low-educated women.

• Not much evidence on mechanisms. Only limited evidence supporting the hypothesized mechanisms of early prenatal care and reduced smoking.